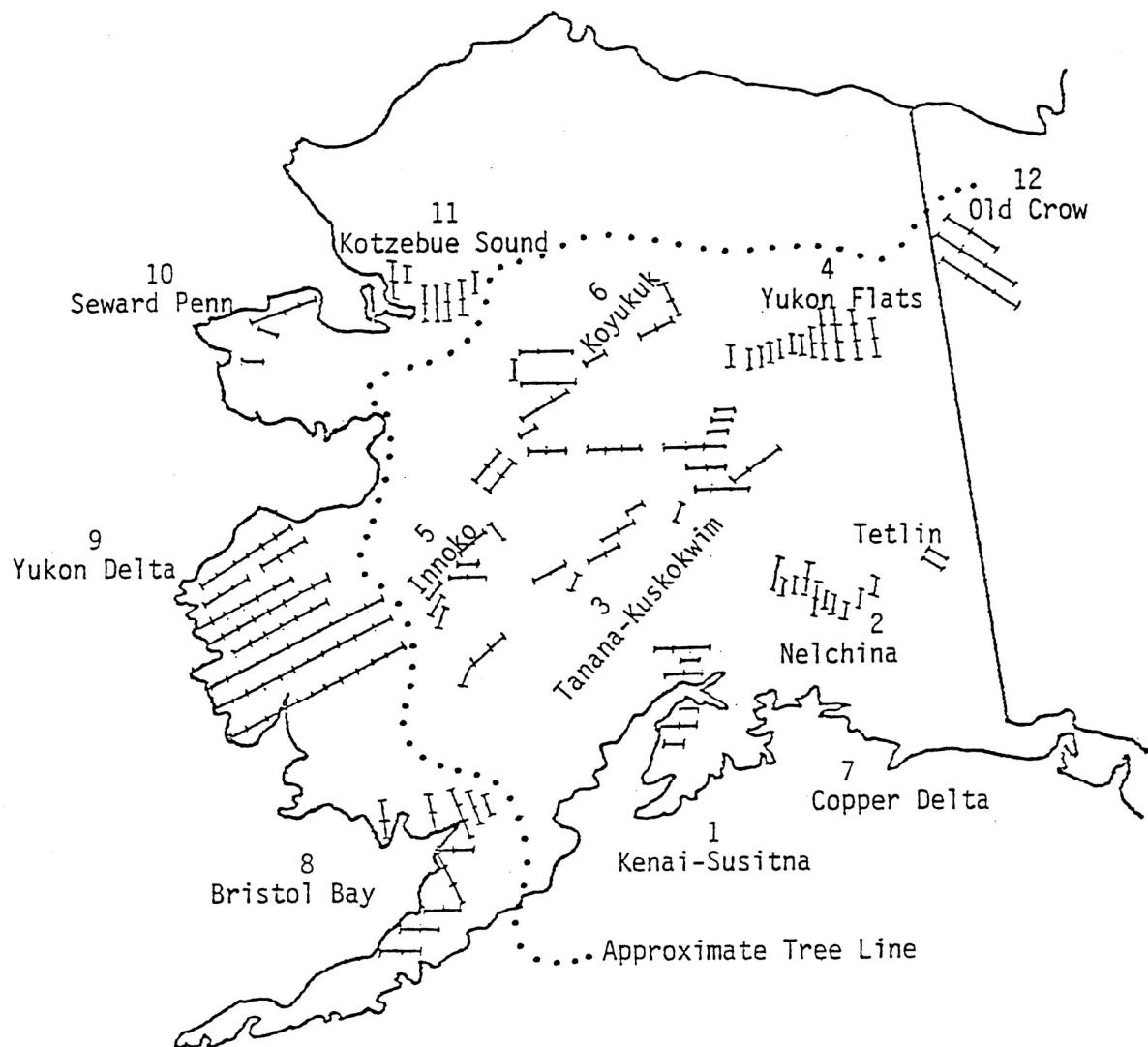


ALASKA - YUKON
WATERFOWL BREEDING POPULATION SURVEY
May 15 to June 7, 2005



By

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U.S. Fish and Wildlife Service
Juneau, Alaska

TITLE: Waterfowl Breeding Population Survey:
Alaska-Yukon (Crew Area 1)

STRATA COVERED: 01, 02, 03, 04, 05, 06, 07, 08,
09, 10, 11, 12

DATES: May 15 to June 7, 2005

DATA SUPPLIED BY: Bruce Conant and Deborah J. Groves
U.S. Fish and Wildlife Service, Juneau, Alaska

ABSTRACT

Alaska and the Yukon Territory generally experienced another widespread, early spring breakup, except for the North Slope which was late and the Old Crow Flats where perhaps more normal phenology occurred. There was some flooding along some of the major rivers. Generally, favorable waterfowl production is anticipated for most of Alaska this year.

Calculated total duck populations decreased in size from 2004. Generally, dabblers, divers and the miscellaneous categories all decreased in size. Some flocked waterfowl were again encountered. Changes in duck populations by category are as follows. Dabblers are down 6% from last year, are 5% below the 10-year average, and are 59% above the long-term mean. Divers are down 12% from 2004, down 3% from the 10-year average, and are up 9% from the long-term mean. Miscellaneous are down 6% from 2004, equal to the 10-year average, and are down 17% from the long-term mean. Total ducks are down 7% from 2004, down 4% from the 10-year average, and are 31% above the long-term mean.

Overall, goose production should be excellent.

Trumpeter swan production should be excellent while tundra swan production should be excellent as well on the western tundra but perhaps only fair at best on the North Slope.

INTRODUCTION

This year Waterfowl Management - Juneau completed the 49th consistent, standardized waterfowl breeding population survey in Alaska. This data set continues to increase in value as a basis for continental, flyway, and state-wide management of the waterfowl resource. The continuation of this historic survey is highly recommended.

We are indebted to John Pribbenow, Daryl Carson, Wade Smith, Brian Milbrett and others at OAS for providing vital maintenance for the aircraft. Doug Alcorn, Russ Oates, Bill Smoke and others in the regional office provided needed support. Special thanks to Ed Mallek, Mike Rearden, Daryle Lons, Mike Spindler, Bill Schaff, Lee Anne Ayres, Sally Jo Collins and Sandra Siekaniec for providing housing and/or vehicles or other logistical support.

METHODS

Survey methods follow "Standard Operating Procedures for Aerial Waterfowl Breeding Ground Population and Habitat Surveys in North America", as revised in 2001. Pond data presented in Table 9 are three year averages from past pond counts using standard methods.

Again this year, positions were captured for all observations with a computer program developed by Jack Hodges. This was accomplished with two computers that are an integral part of the panel of the specially modified de Havilland Turbo Beaver aircraft. A moving map program also developed by Jack was used in conjunction with preprogrammed routes in the GPS to aid in navigation down transect lines. The combination of these two innovations was especially user friendly and significantly reduced the pilot workload again this year. A new computer transcribe program developed by Jack further eased the transcription workload for both observers.

The combination of GPS navigation, experimental satellite transmission of data to ground based computers, and recent advances in voice recognition technology offer enticing possibilities for the future. Perhaps someday soon voice observations attached to precise locations from anywhere over the earth can be sent directly from survey aircraft instantaneously to computers anywhere on the planet. At such a time, one could watch the results of the North American Waterfowl Population Survey accumulate before one's eyes at a computer screen at command central at Laurel, Maryland.

Data entry into laptop computers, in the field, has now become the standard operating procedure for continental aerial waterfowl surveys. All stratum summaries and tables for this report were again computer generated. Data were provided to the Division of Migratory Bird Management (DMBM) via electronic mail from Anchorage after completion of the survey.

The survey design contains 12 strata with 232 segments. Because of poor flying weather, the Copper River Delta (stratum 07) was not surveyed this year and an average was included in this year's results. The Alaska unit contains 214 segments each 16 miles in length and 10 segments each 8 miles in length. The Yukon unit has 8 segments each 18 miles in length. All segments were flown again in the usual sequence in 2004.

A six year (1986-1991) helicopter-fixed wing comparison study in Alaska resulted in the development of new visibility correction factors (VCFs). New average rates specific for waterfowl habitats in Alaska; boreal forest (strata 1-7), tundra (strata 8-11) and the Old Crow Flats in Canada (stratum 12) were employed starting in 1992 and also were applied to the historical data set.

Because of a slight difference in the application of the VCFs for a few specific years (1986-1991), the data presented here are slightly different for some species for those years than those presented by DMBM. Both interpretations reflect a major step in the direction of presenting a more accurate picture of continental duck populations for the last 50 years. Also, in our analyses we do not apply any VCF to Canada goose observations as DMBM does. In 2002 a decision was made by our Waterfowl Management Branch in Alaska to double all observations of single geese in calculating indicated total geese. Historical tables have been recalculated to reflect this change. Beginning in 2002, DMBM also started deleting all flock sightings of over 45 from the calculation of continental population indices while the results reported here include these flocked observations.

WEATHER AND HABITAT CONDITIONS

This year a generally widespread, early spring breakup occurred throughout Alaska except for the North Slope (which was late) and the Old Crow Flats in the Yukon Territory (which had a more normal phenology). Ice melt and vegetation green up appeared very early and almost no snow cover was observed on the waterfowl nesting habitat during the survey.

Brina Kessel reported ice melt and leaf out in paper birch at Ballaine Lake near Fairbanks were on the very early side of early this year. Normal flooding was encountered on the Koyukuk and Innoko Rivers as well as on the lower Yukon, Kobuk and Selawik Rivers.

BREEDING POPULATION ESTIMATES

- A. **Ducks:** Changes in selected species and groups are as follows with all species presented in Table 2 (numbers in thousands).

Species	2005 Indices	Percent Change From		
		2004	10-year mean ¹	long-term mean ²
Mallard	703.3	- 13	+ 1	+ 93
Wigeon	873.2	- 3	- 11	+ 68
G.W. Teal	713.1	- 13	- 7	+ 94
Shoveler	666.2	+ 4	+ 5	+147
Pintail	905.5	- 2	- 8	n.c.
Total Dabblers	3866.8	- 6	- 5	+ 59
Canvasback	95.1	- 55	- 23	+ 4
Scaups	960.8	- 4	- 3	+ 4
Bufflehead	51.7	+ 18	+ 18	+ 18
Total Divers	1247.4	- 12	- 3	+ 9
Long-tailed Duck	66.3	- 20	- 25	- 52
Eiders	7.9	- 55	- 42	- 72
Scoters	350.2	- 5	+ 4	- 7
Total Miscellaneous	460.7	- 6	n.c.	- 17
TOTAL DUCKS	5574.9	- 7	- 4	+ 31

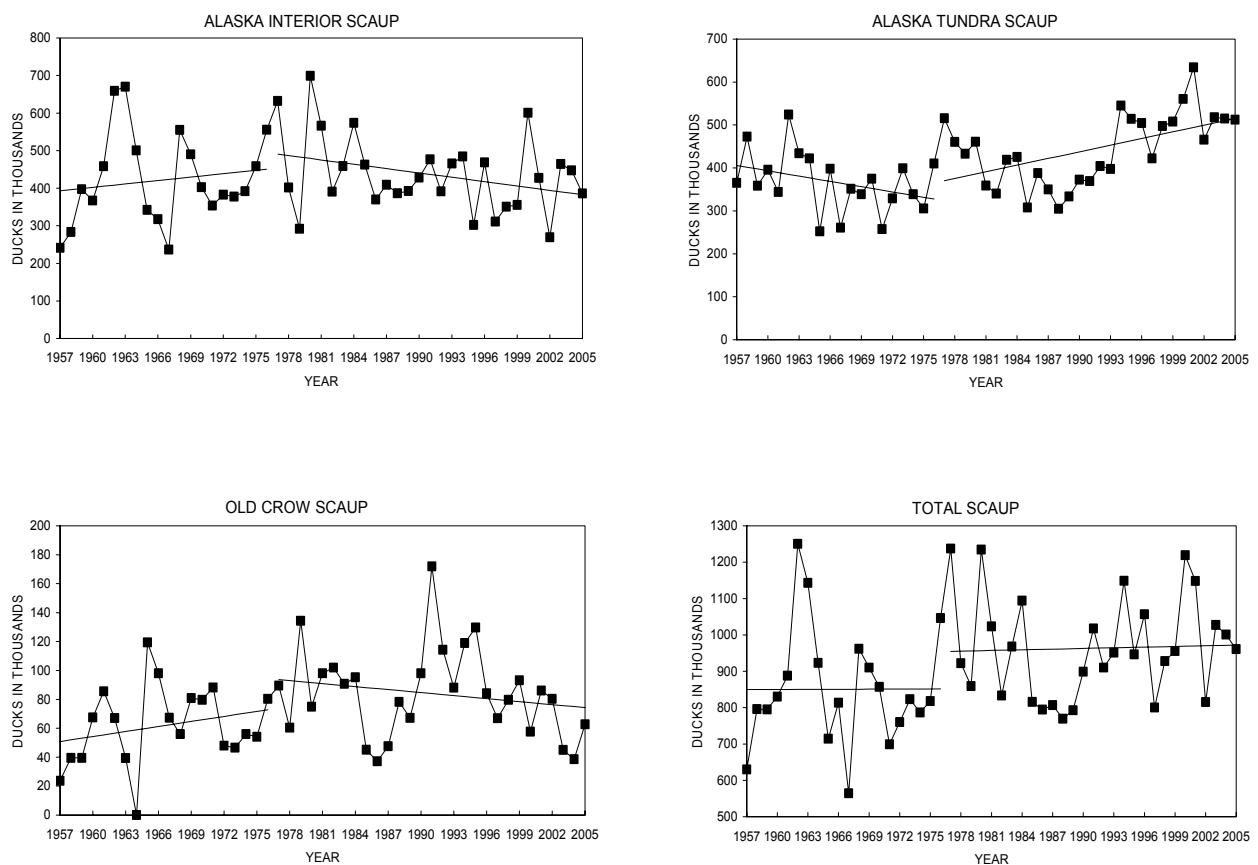
¹ Average for Alaska-Yukon (strata 1-12) for 1995-2004.

² Average for Alaska-Yukon (strata 1-12) for 1957-2004.

This year's waterfowl population estimates should again be viewed with caution. Our survey timing was normal this year but, because of the very early arrival of spring, the migration of waterfowl from southern wintering areas was probably advanced for some species such as interior scoters and scaup.

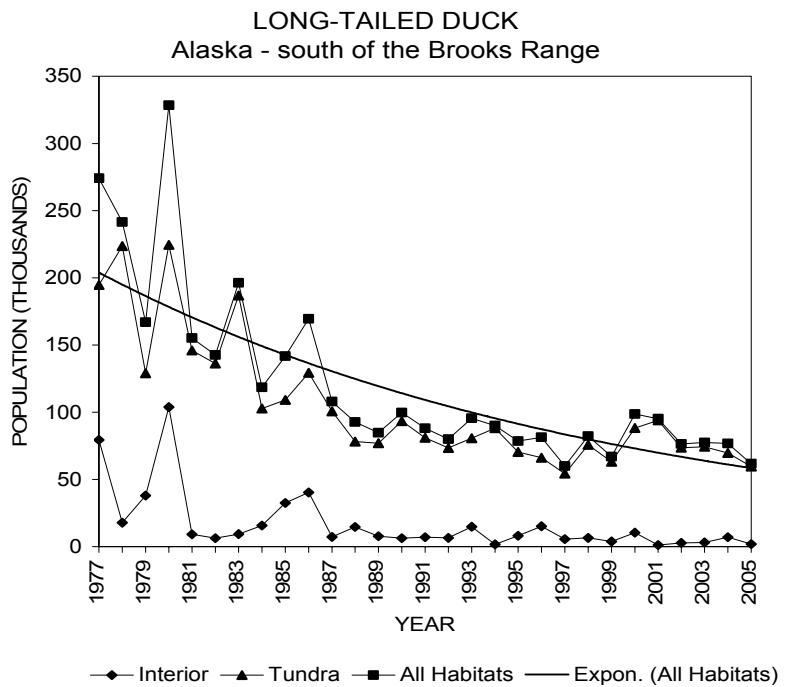
Total dabbler populations decreased from last year but remain above the long term mean. All population estimates for the major dabbler species decreased except for those for shovelters which increased slightly.

Canvasback populations decreased significantly from last year and the previous ten year average and included some flocked birds. Bufflehead numbers increased from last year and are above both averages. Total scaup numbers decreased slightly from 2004 and are near both averages. The following graphs illustrate recent scaup trends (minus the North Slope).

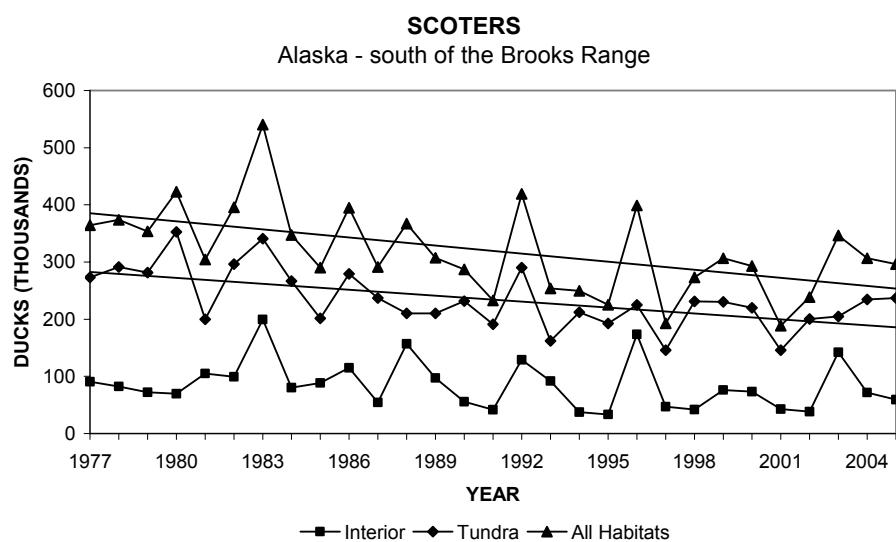


Based on a small sample, the eider index decreased significantly from last year and remains below the long term average. It should be noted that all of the eiders identified to species again this year were common eiders.

Long-tailed duck numbers decreased from last year and are significantly below both averages. We are encouraged that the downward slide is being investigated. Here is a graphic presentation of the last 29 year trend in the long-tailed duck index (minus the North Slope).



Interior scoter numbers may be misleading but total scoter populations decreased from those for last year and are above the 10 year average and below the long term mean. Special scoter surveys underway on the Yukon Flats and the Yukon Delta will better evaluate scoter populations. A graph of the scoter index over the last 29 years is presented below (minus the North Slope).

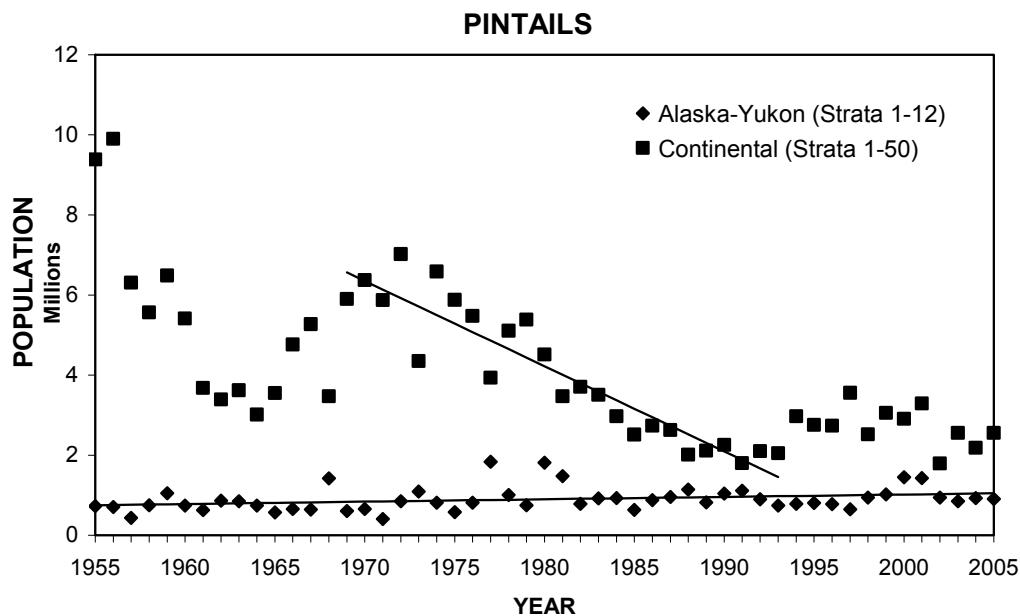


Historical data from this survey, 1957-1994, have been analyzed and a major paper detailing the results has been published (*Hodges et al 1996*). Two lines were fitted to the duck data because of the increased visibility from the use of the turbine beaver (N-754) beginning in 1977. Because of the need to partition all of the historical duck data into two parts (1957-1976/1977-present), the comparisons to just long-term averages presented above may be misleading.

The generally early arrival of spring in Alaska with just normal flooding will enhance waterfowl production south of the Brooks Range. Overall, excellent duck production is anticipated from a major portion of these northwestern areas in 2005. The results of similar surveys on the North Slope of Alaska will be reported separately.

Intensive waterfowl breeding population surveys have been conducted over all the major tundra habitat in Alaska during the last decade. A detailed comparison of the results of these expanded surveys over the years with this historical survey is underway for all of our tundra strata. The comprehensive duck production surveys conducted in recent years in Alaska remain on hold. A detailed analysis and summary report of those surveys are in progress.

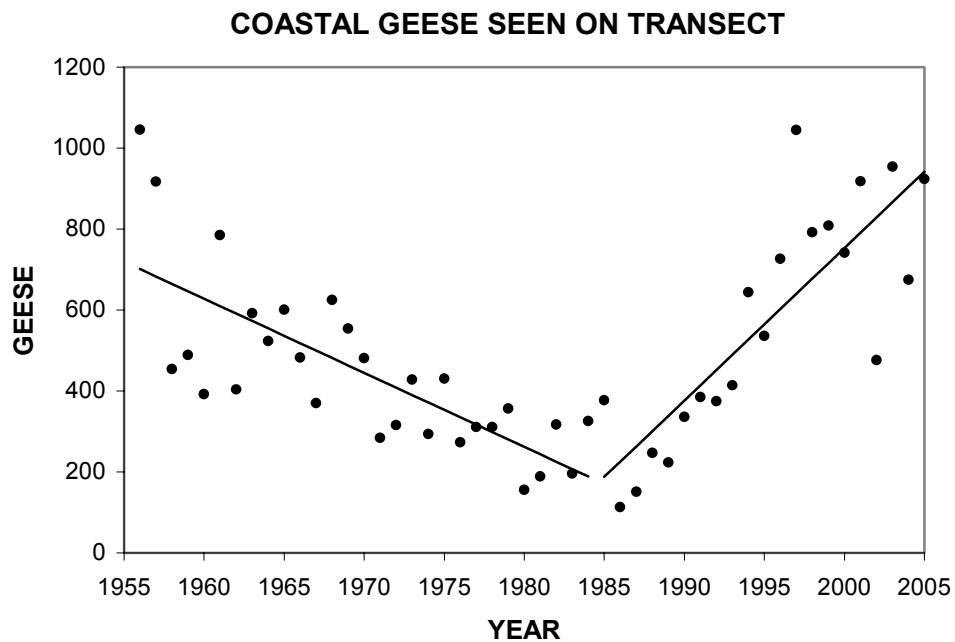
The pintail has traditionally been Alaska's most numerous dabbler species and in recent years a significant proportion of Pacific Flyway pintails have been tallied in Alaska. The following graph depicts pintail populations measured in Alaska-Yukon (minus the North Slope) in relation to continental (strata 1-50) populations since 1955. Fitted lines show a dramatic decline in continental populations since 1969 ($p<.01$) and a slight increase in Alaska populations ($p=.07$) over the history of the survey. This year Alaska -Yukon hosted 35% of the continental index. We are encouraged by the recent creation of a Pintail Action Group to bring attention to the continental decline.



This survey was designed for ducks but other species (geese, swans, cranes, loons, grebes) are recorded routinely and an impression of their welfare is developed from our observations and the reports of others in the field.

B. **Geese:**

The following graph depicts the trend of all geese recorded on the 5 segments of the duck survey within the coastal zone of the Yukon-Kuskokwim Delta (actual geese seen on transect only). One year, 1964, was excluded because of the extreme weather conditions experienced that year (King and Conant 1983). Two lines were fit to these data (first 1957-1984, second 1985-2004). Restricted hunting regulations were first employed in 1984 and in subsequent years within the Yukon-Kuskokwim Delta Goose Management Plan. Thus data for 1985 and the years following probably reflect a response of goose populations (mostly white-fronts and cacklers) to those restrictions. The recent, dramatic upward trend is heartening and continued surveys in the years ahead will reveal whether populations can be maintained or even increased from former levels as hunting effort increases. The dramatic decline depicted in 2002 is thought to be a result of an unusual spring migration.



Probably an excellent rate of goose production can be expected south of the Brooks Range.

A progress report by Migratory Birds - Anchorage will detail the results of the nineteenth year of an intensive aerial survey program on the coastal goose nesting zone of the Yukon-Kuskokwim Delta.

The specialized survey for Dusky Canada geese that this project had flown for 8 continuous years (1983-1990) was discontinued in 1991. The more extensive survey flown on the Copper River Delta by Migratory Birds - Anchorage since 1986 is now the breeding population survey which best monitors this nesting population. The results of that effort will be detailed elsewhere.

Little specific information on other populations of white-fronted and lesser Canada geese is available, but production should, on the whole, be excellent for interior Alaska.

C. **Swans:**

1. Trumpeter - A census of Trumpeters, after hatching, on the breeding grounds in Alaska in 2000 found 17,155 total swans. Swan observations from boreal forest strata (1-4, 6 and 7) on the duck survey in 2005 suggest a population of 12,100 adults and sub adults (includes 1,500 from 2004 for stratum 7), a slight decrease from last year which may be a reflection of the mounting losses to lead poisoning in western Washington and southwestern British Columbia in recent years. A census of Trumpeters in Alaska, planned for this August, can better detect suspected changes in the population size. Production this year should generally be excellent in Alaska.
2. Tundra - The population index this year from the tundra strata (8-11), not including the North Slope, is 141,700; 38% below last year and 6% above the 10-year average. The breeding index (singles and pairs) is 73,900; down 1% from 2004 and 6% below average. The total number of swans sighted with nests is down 9% from last year's and is 5% above the 10 year average. Overall, excellent production is expected from tundra swans in western Alaska in 2005.

D. **Cranes:**

The Sandhill Crane index in 2005 was 33,100 for Alaska, down 22% from 2004 and 27% below the 10-year average.

E. **Loons:**

1. The 2005 Red-Throated Loon index for Alaska was 10,000, down 11% from 2004 and 14% above the 10-year average.
2. The 2005 Pacific Loon index for Alaska was 43,200, down 19% from 2004 and 13% below the 10-year average.
3. The 2005 Common Loon index for Alaska was 10,500, down 7% from 2004 and 12% above the 10-year average.

CONCLUSION

The generally widespread, early arriving spring breakup in Alaska should result in generally excellent waterfowl production except on the North Slope of Alaska and the Old Crow Flats in the Yukon.

Perhaps an advanced spring waterfowl migration of a few species (diving and miscellaneous ducks) resulted in population estimates of these species which are not strictly comparable to past years. Generally excellent waterfowl production in this northwestern corner of the North American continent can be expected.

TELEMETRY

A Telonics, telemetry, receiver-scanner is an integral component of the special survey aircraft used. Throughout the survey we listened for a list of frequencies of radio transmitters put on scoters south of Alaska. Extensive coverage of most waterfowl nesting habitats in Alaska (except the North Slope) plus the Old Crow Flats in the Yukon was accomplished during the course of this survey but for most of the trip we were at low level (where reception is limited). The following signals were received.

Frequency	Date	Location
167.020	5/15	22 nm NE of Kenai
167.998	5/26	15 nm SW of Fairbanks
168.030?	5/28	85 nm S of King Salmon (we recorded 164.030)
165.282	5/29	32 nm S of Dillingham
167.556	5/29	34 nm SE of Bethel
166.596	6/03	92 nm SW of Kotzebue (we recorded 164.596)
166.094	6/05	90 nm NE of Fairbanks
166.007	6/05	37 nm N of Fairbanks

Note: No double beats were noticed on any of these receptions.

LITERATURE CITED

Hodges, J.I., J.G. King, B. Conant and H.A. Hanson. 1996. Aerial Surveys of Waterbirds in Alaska 1957-94: Population Trends and Observer Variability. Information and Technology Report 4. U.S. Dept. of the Interior-National Biological Service. 24pp.

ADDENDUM

The following figures show the relative distribution and abundance by stratum of total scoter populations for 2005 (Figure 1) and the relative species composition of the three species of scoters identified within each stratum (Figure 2). Note that total populations are calculated from counts within the whole transect width (200 m each side of the flight line) while species composition was calculated from counts only within the closest half of the transect width (100 m each side of the flight line).

Also attached is Figure 3 with graphs showing the historical trends of the most numerous waterfowl species recorded. The graphs include strata 1-12, except for swans as noted. Note that not all species were counted from the beginning of aerial surveys in 1957. Caution should be exercised in viewing these graphs because of the visibility factor mentioned above with the introduction of the special survey aircraft in 1977.

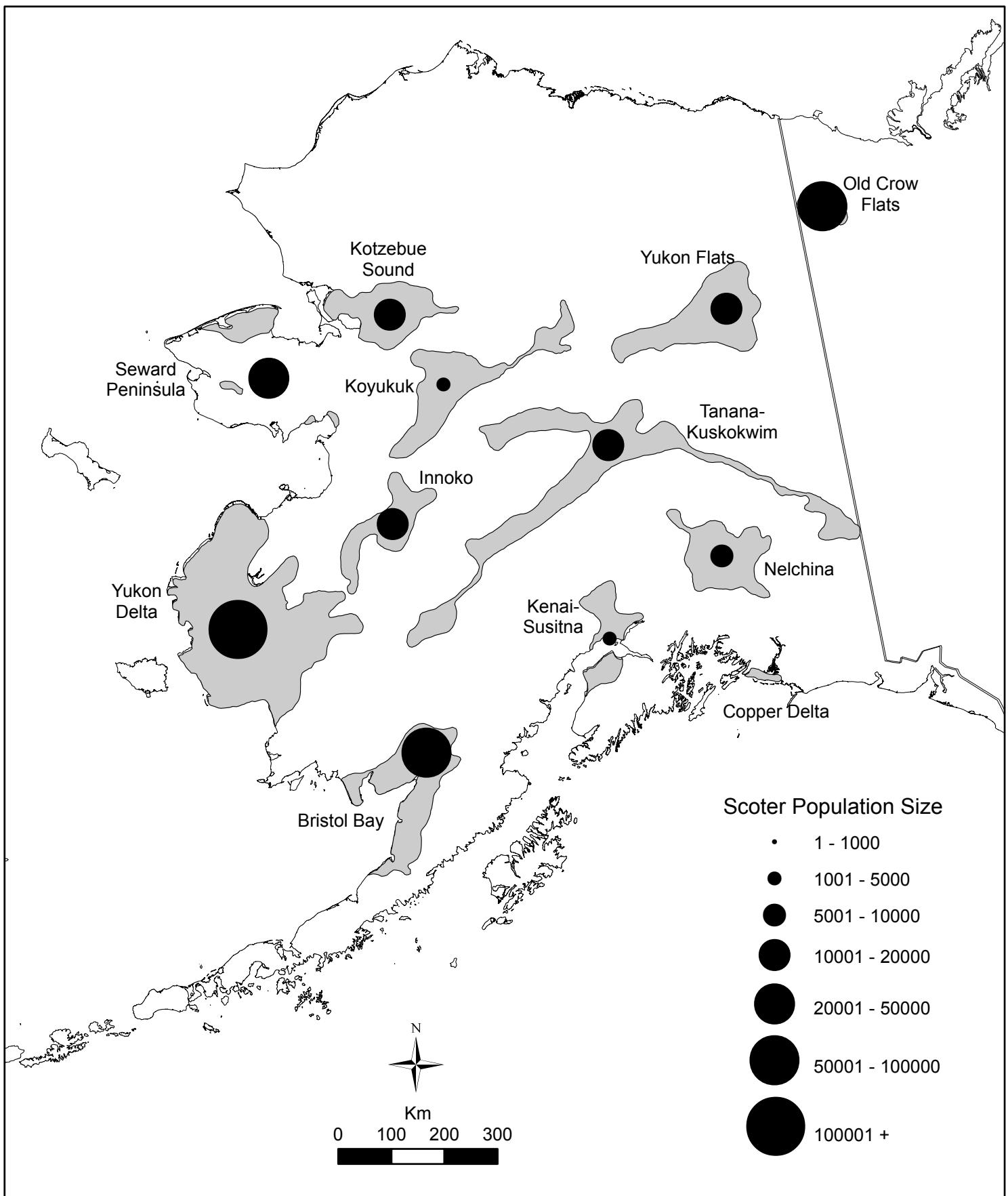


Figure 1. The relative abundance and distribution of total scoter populations in Alaska-Yukon Strata 1-12 from the air survey in 2005. Populations are calculated using data from the full transect width (200 m each side of the flight line). Copper Delta stratum was not flown in 2005.

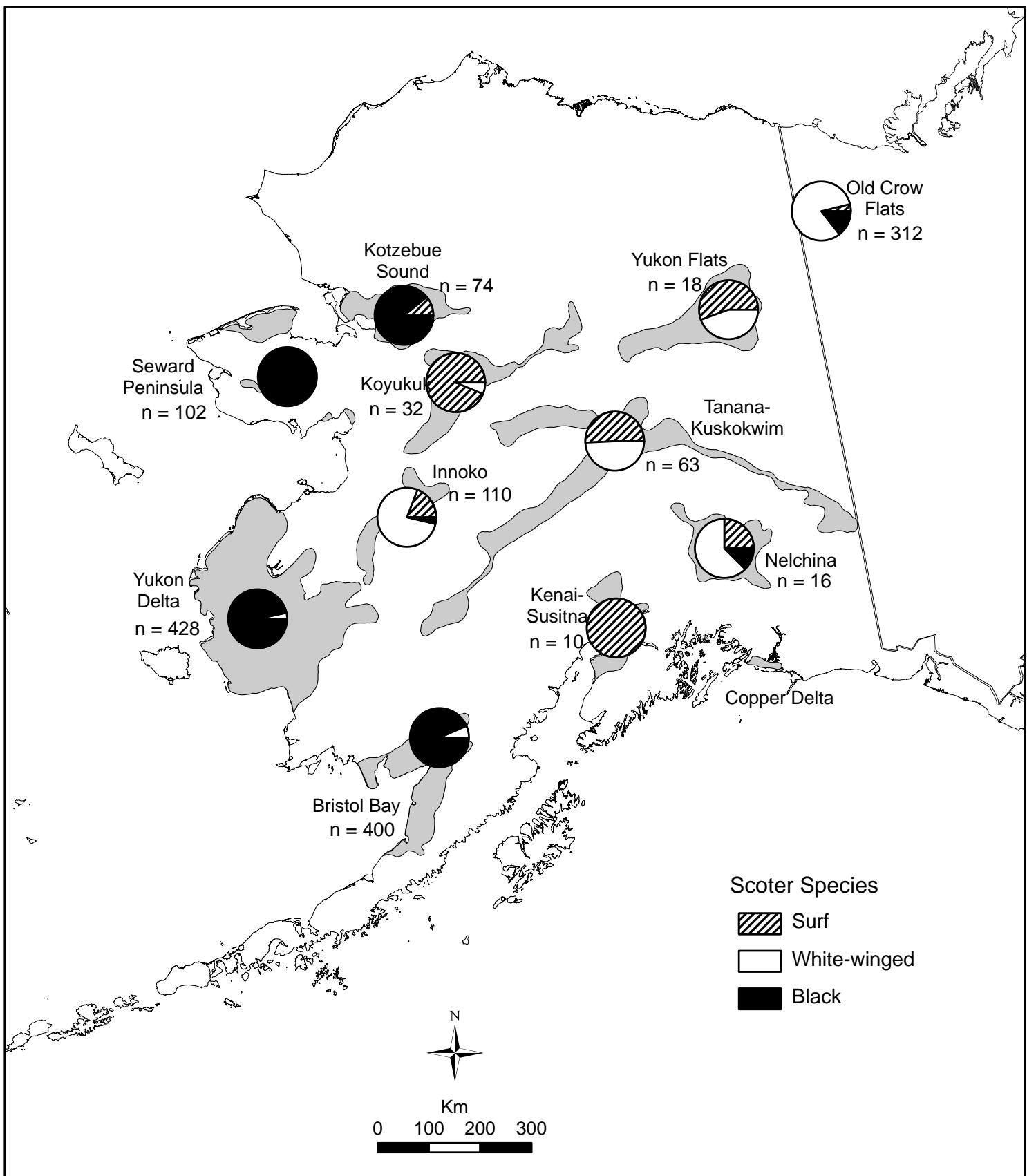


Figure 2. The relative species composition of the three species of scoters in Alaska-Yukon Strata 1-12 from the air survey in 2005. The species composition was calculated from counts only within the closest half of the transect width (100 m each side of the flight line). N = the number of indicated birds that were identified to species. Copper Delta stratum was not flown in 2005.

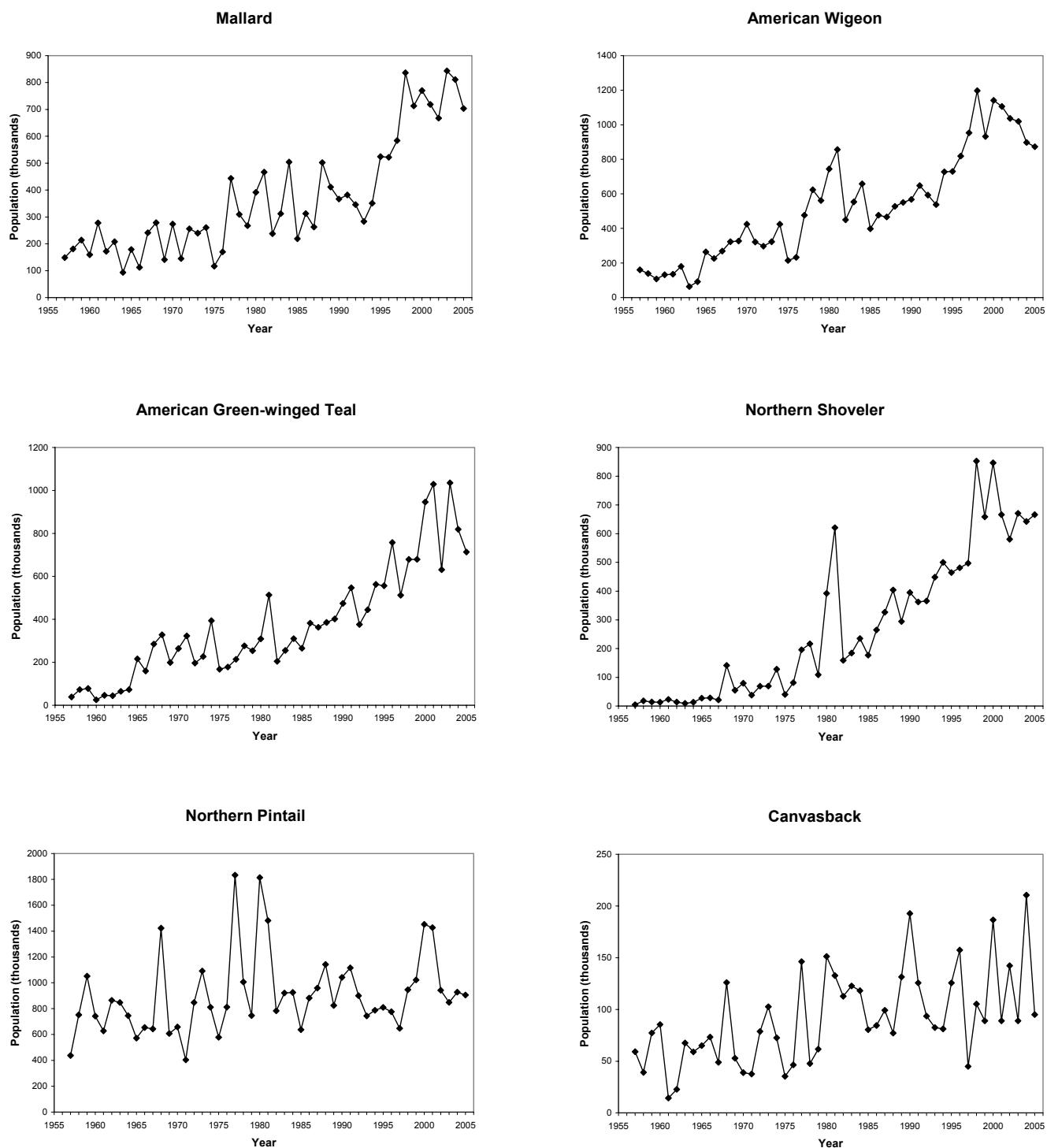


Figure 3. Historical trends for selected species or groups for strata 1-12 (except as noted) from Alaska-Yukon Breeding Population Surveys.

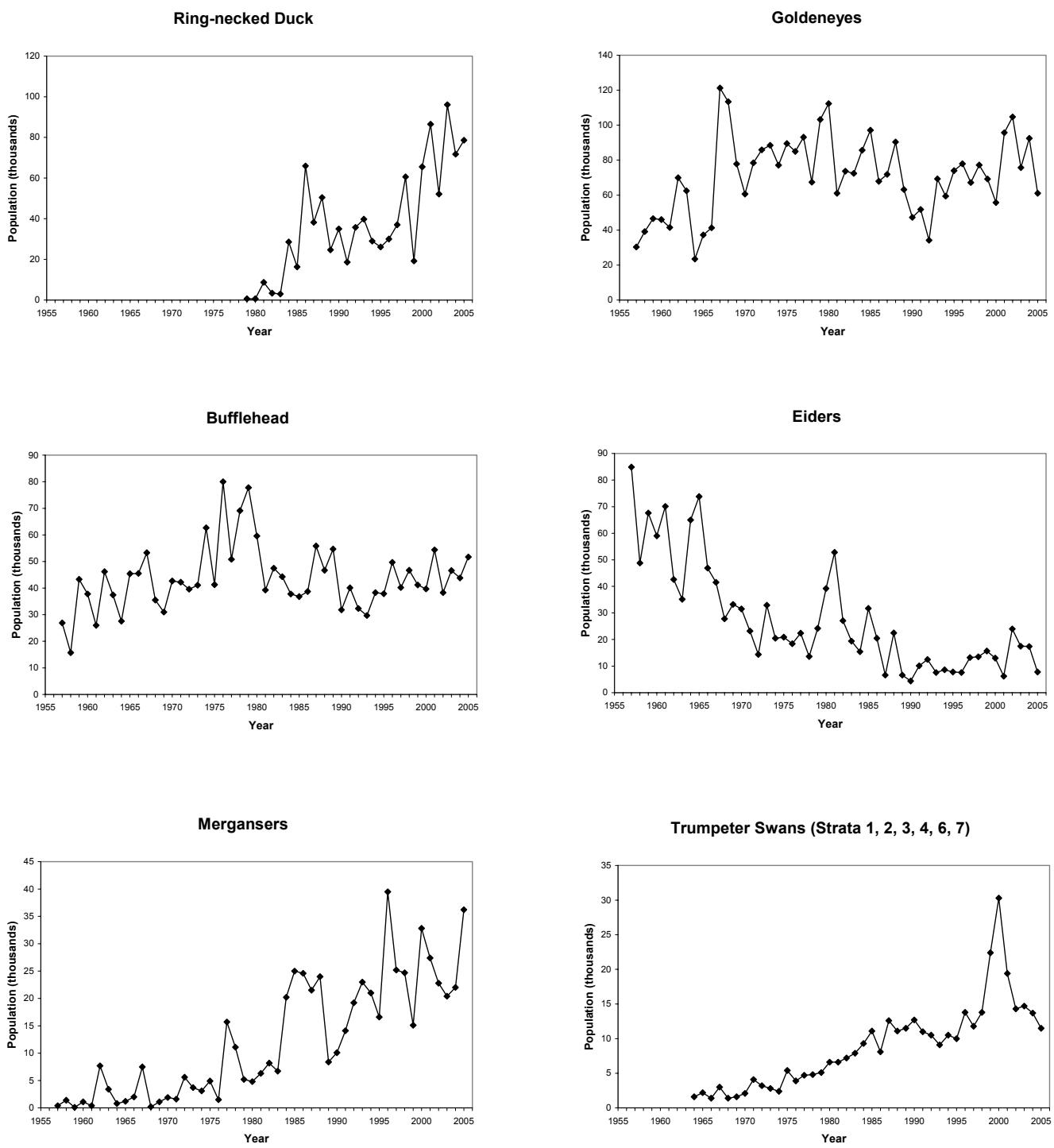


Figure 3. (Continued)

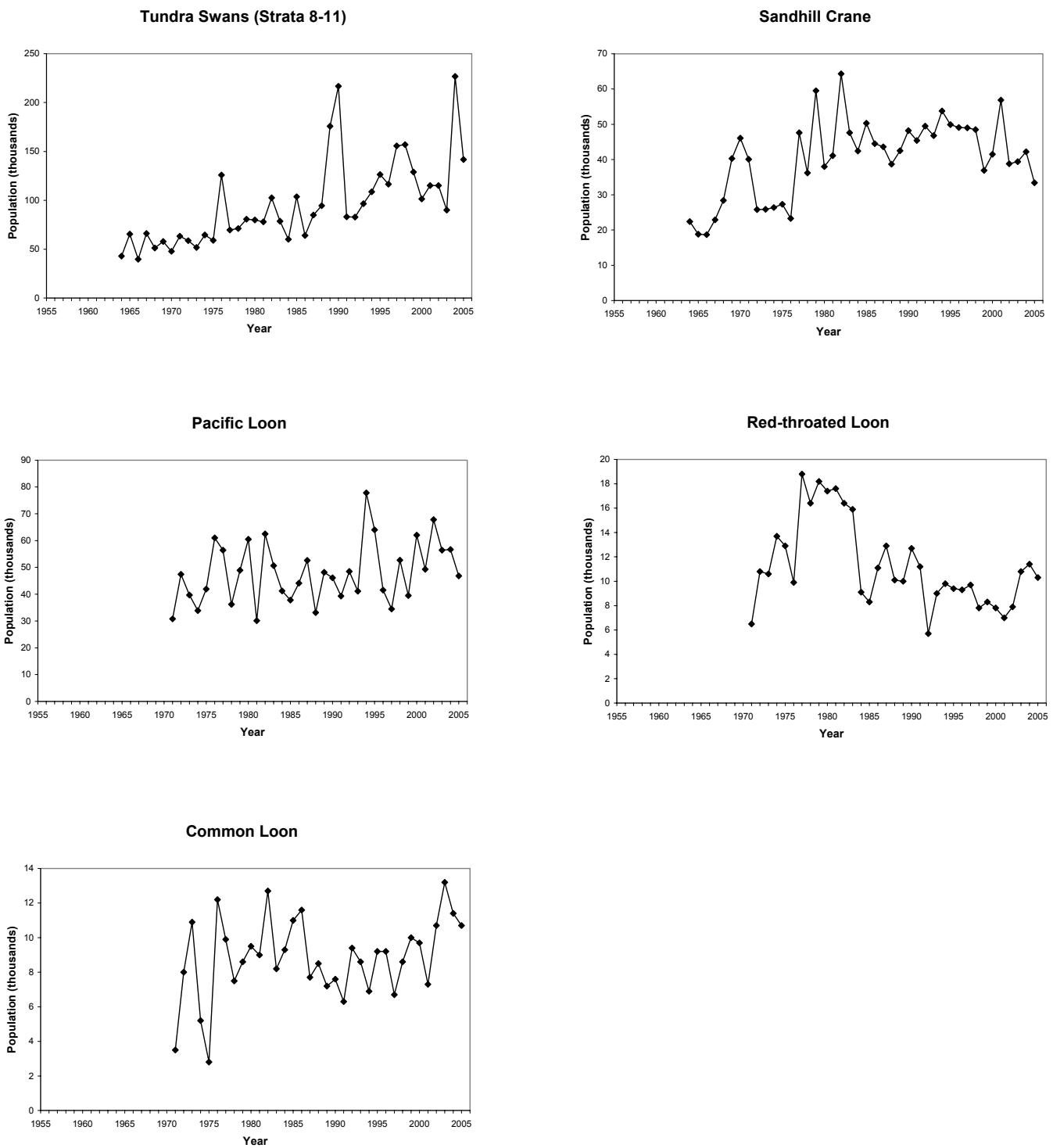


Figure 3. (Continued)

Table 1. Alaska-Yukon. Ten year trend in adjusted waterfowl breeding population estimates by species, 1996 - 2005 (estimates in thousands).

Species	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ducks:										
Dabblers:										
Mallard	522.0	584.4	836.1	712.9	770.2	718.3	667.2	843.5	811.1	703.3
Black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	5.2	1.3	0.3	4.9	2.7	6.5	1.0	4.6	1.9	2.7
Am. wigeon	818.7	953.6	1196.9	932.4	1141.3	1106.0	1036.5	1019.5	897.1	873.2
G.W. teal	757.9	512.3	678.9	679.5	946.4	1029.0	631.1	1035.4	818.6	713.1
B.W. teal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	2.2	2.8
N. shoveler	481.2	497.2	852.5	658.3	846.5	666.2	580.7	671.0	642.5	666.2
Pintail	776.0	647.3	946.0	1021.9	1452.4	1426.4	942.0	848.3	927.4	905.5
SUBTOTAL	3361.0	3196.1	4510.7	4009.9	5159.5	4952.4	3858.5	4425.2	4100.8	3866.8
Divers:										
Redhead	0.6	0.2	0.0	0.0	0.6	0.0	4.6	3.0	2.4	0.2
Canvasback	157.5	44.9	105.4	89.0	186.7	89.0	142.4	88.9	210.6	95.1
Scaups	1056.9	800.0	927.9	956.1	1219.1	1148.1	815.4	1027.2	1001.0	960.8
Ringneck	29.9	37.0	60.5	19.0	65.3	86.4	51.9	96.2	71.5	78.6
Goldeneyes	77.8	67.2	77.2	69.3	55.6	95.7	104.7	75.8	92.5	61.0
Bufflehead	49.7	40.2	46.7	41.1	39.7	54.3	38.3	46.7	43.9	51.7
SUBTOTAL	1372.4	989.5	1217.7	1174.5	1567.0	1473.5	1157.3	1337.8	1421.9	1247.4
Miscellaneous:										
L.T. Duck	87.9	68.6	90.9	72.1	105.2	99.8	84.1	83.2	83.3	66.3
Eiders	7.6	13.2	13.5	15.7	13.0	6.2	24.1	17.5	17.4	7.9
Scoters	460.8	235.6	348.4	345.9	327.1	242.5	319.7	399.0	367.3	350.2
Ruddy duck	0.8	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.8	0.0
Mergansers	39.4	25.2	24.6	15.0	32.9	27.2	22.9	20.6	22.0	36.3
SUBTOTAL	596.5	342.6	477.4	448.7	478.2	376.7	450.8	520.3	490.8	460.7
TOTAL DUCKS	5329.9	4528.2	6205.8	5633.1	7204.7	6802.6	5466.6	6283.3	6013.5	5574.9

Table 2. Alaska-Yukon. Status of adjusted waterfowl breeding population estimates by species and strata, comparing 2005 with 2004 and the 1995 - 2004 average (estimates in thousands).

Species	Strata*			Total 2005	Total 2004	1995 - 2004 Average	% Change from 2004	% Change from Avg.
	1-7	8-11	12					
Ducks:								
Dabblers:								
Mallard	328.2	361.0	14.1	703.3	811.1	699.0	-13	+1
Black duck	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Gadwall	0.0	2.7	0.0	2.7	1.9	2.9	+42	-7
Am. wigeon	469.2	335.4	68.6	873.2	897.1	983.2	-3	-11
G.W. teal	354.6	347.3	11.2	713.1	818.6	764.5	-13	-7
B.W. teal	2.8	0.0	0.0	2.8	2.2	0.8	+27	+250
N. shoveler	338.3	308.0	19.9	666.2	642.5	636.1	+4	+5
Pintail	226.2	654.0	25.3	905.5	927.4	979.8	-2	-8
SUBTOTAL	1,719.3	2,008.4	139.1	3,866.8	4,100.8	4,066.3	-6	-5
Divers:								
Redhead	0.0	0.0	0.2	0.2	2.4	1.1	-92	-82
Canvasback	65.6	22.7	6.8	95.1	210.6	124.0	-55	-23
Scaups	385.7	512.4	62.7	960.8	1,001.0	989.8	-4	-3
Ringneck	73.2	3.4	2.0	78.6	71.5	54.4	+10	+45
Goldeneyes	52.0	3.7	5.3	61.0	92.5	79.0	-34	-23
Bufflehead	50.3	1.2	0.2	51.7	43.9	43.9	+18	+18
SUBTOTAL	626.8	543.4	77.2	1,247.4	1,421.9	1,292.1	-12	-3
Miscellaneous:								
L.T. Duck	2.0	59.7	4.6	66.3	83.3	88.6	-20	-25
Eiders	0.0	7.9	0.0	7.9	17.4	13.6	-55	-42
Scoters	59.3	237.0	53.9	350.2	367.3	335.6	-5	+4
Ruddy duck	0.0	0.0	0.0	0.0	0.8	0.3	-100	-100
Mergansers	12.3	15.8	8.2	36.3	22.0	24.7	+65	+47
SUBTOTAL	73.6	320.4	66.7	460.7	490.8	462.7	-6	-0
TOTAL DUCKS	2,419.7	2,872.2	283.0	5,574.9	6,013.5	5,821.1	-7	-4

* 1-7 Interior Alaska Taiga; 8-11 Coastal Alaska Tundra; 12 Old Crow Flats, Yukon Territory, Canada

Table 3. Alaska. Ten year trend in tundra swan breeding population observations, 1996 - 2005 (estimates in thousands).

Stratum	Status	Y E A R										1995 - 2004 Average	% Change from 2004	% Change from Avg
		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005			
8	Singles & pairs	12.2	9.1	12.4	10.9	10.9	11.2	12.7	13.7	10.9	8.5	11.4	-22	-25
	Bristol Bay Flocks	1.5	4.0	1.5	3.8	5.4	3.2	5.1	1.2	2.4	15.6	3.8	+550	+311
	Total	13.7	13.1	13.9	14.7	16.3	14.4	17.8	14.9	13.3	24.1	15.2	+81	+59
9	Singles & pairs	50.2	59.3	58.6	62.3	52.6	49.8	50.7	51.6	49.8	53.2	53.1	+7	+0
	Yukon Delta Flocks	40.0	62.4	58.1	35.4	15.1	32.7	26.6	6.8	143.1	52.2	47.0	-64	+11
	Total	90.2	121.7	116.7	97.7	67.7	82.5	77.3	58.4	192.9	105.4	100.1	-45	+5
10	Singles & pairs	6.5	7.3	5.2	8.1	7.3	6.2	8.1	7.4	8.3	5.5	7.0	-34	-21
	Seward Pen. Flocks	0.0	0.4	3.4	0.0	0.0	4.0	0.0	0.8	0.6	0.0	0.9	-100	-100
	Total	6.5	7.7	8.6	8.1	7.3	10.2	8.1	8.2	8.9	5.5	7.9	-38	-30
11	Singles & pairs	6.1	7.0	7.0	8.5	8.5	6.8	8.9	7.8	5.6	6.7	7.0	+20	-4
	Kotzebue So. Flocks	0.0	6.1	10.7	0.0	1.7	1.1	3.0	0.8	6.1	0.0	3.0	-100	-100
	Total	6.1	13.1	17.7	8.5	10.2	7.9	11.9	8.6	11.7	6.7	10.0	-43	-33
Total	Singles & pairs	75.0	82.7	83.2	89.8	79.3	74.0	80.4	80.5	74.6	73.9	78.5	-1	-6
	Flocks	41.5	72.9	73.7	39.2	22.2	41.0	34.7	9.6	152.2	67.8	54.8	-55	+24
	Total	116.5	155.6	156.9	129.0	101.5	115.0	115.1	90.1	226.8	141.7	133.3	-38	+6

Note: There are additional tundra swans nesting in Alaska outside of these strata.

Actual swans observed are expanded for area only.

Table 4. Alaska-Yukon. Ten year trend in sandhill crane breeding population observations, 1996 - 2005 (estimates in thousands).

Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	1995 - 2004	% Change from 2004	% Change from Avg.
											Average		
1. Kenai-Susitna	0.1	0.0	0.1	0.0	0.7	0.1	0.3	0.0	0.4	0.2	0.2	-50	+0
2. Nelchina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
3. Tanana-Kusko.	0.2	0.8	0.4	0.2	1.3	1.3	0.7	1.3	1.0	0.6	0.8	-40	-25
4. Yukon Flats	1.9	2.2	3.2	0.4	1.8	0.5	1.4	1.5	1.5	1.1	1.6	-27	-31
5. Innoko	0.2	0.2	1.1	1.5	0.5	0.7	0.4	0.2	0.4	0.5	0.6	+25	-17
6. Koyukuk	1.1	1.1	0.6	0.9	1.4	1.4	0.6	0.8	2.3	0.6	1.1	-74	-45
7. Copper Delta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Subtotal - Interior	3.5	4.3	5.4	3.0	5.7	4.0	3.4	3.8	5.6	3.0	4.2	-46	-29
8. Bristol Bay	5.3	4.6	2.4	2.9	5.1	6.1	5.9	3.8	2.4	2.5	4.4	+4	-43
9. Yukon Delta	30.8	31.7	29.8	22.2	18.2	34.6	19.5	23.2	22.5	22.3	26.2	-1	-15
10. Seward Pen.	5.4	3.7	8.0	4.0	5.2	6.3	7.6	5.1	9.2	2.2	6.2	-76	-65
11. Kotzebue So.	4.2	4.5	3.0	4.8	7.2	5.8	2.3	3.6	2.6	3.1	4.2	+19	-26
Subtotal - Tundra	45.7	44.5	43.2	33.9	35.7	52.8	35.3	35.7	36.7	30.1	41.0	-18	-27
TOTAL - ALASKA	49.2	48.8	48.6	36.9	41.4	56.8	38.7	39.5	42.3	33.1	45.2	-22	-27
12. Old Crow Flats Yukon	0.0	0.2	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.3	0.1	-	+200

Note: There are additional sandhill cranes nesting in Alaska - Yukon outside of these strata.

Actual sandhill cranes observed are expanded for area only.

Table 5. Alaska-Yukon. Ten year trend in red-throated loon breeding population observations, 1996 - 2005 (estimates in thousands).

Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	1995 - 2004	% Change from 2004	% Change from Avg.
											Average		
1. Kenai-Susitna	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	-100	-100
2. Nelchina	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	-	+0
3. Tanana-Kusko.	0.6	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.2	+0	-50
4. Yukon Flats	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	-	-100
5. Innoko	0.6	0.5	0.1	0.5	0.3	0.0	0.3	0.9	1.0	0.5	0.4	-50	+25
6. Koyukuk	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.1	0.2	0.1	+100	+100
7. Copper Delta	0.1	0.1	0.3	0.1	0.1	0.3	0.0	0.0	0.0	0.1	0.1	-	+0
Subtotal - Interior	1.7	1.4	0.6	1.0	0.8	0.7	1.0	1.4	1.3	1.0	1.1	-23	-9
8. Bristol Bay	0.5	0.4	1.5	1.1	1.2	0.9	0.6	1.3	1.3	1.2	1.0	-8	+20
9. Yukon Delta	4.3	5.1	2.7	3.8	2.6	4.9	3.9	3.6	5.4	4.4	4.1	-19	+7
10. Seward Pen.	2.2	2.2	2.3	2.3	2.6	0.3	1.9	3.4	2.9	3.2	2.2	+10	+45
11. Kotzebue So.	0.3	0.3	0.8	0.1	0.6	0.3	0.3	0.9	0.3	0.2	0.4	-33	-50
Subtotal - Tundra	7.3	8.0	7.3	7.3	7.0	6.4	6.7	9.2	9.9	9.0	7.7	-9	+17
TOTAL - ALASKA	9.0	9.4	7.9	8.3	7.8	7.1	7.7	10.6	11.2	10.0	8.8	-11	+14
12. Old Crow Flats Yukon	0.1	0.3	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.4	0.2	+100	+100

Note: There are additional red-throated loons nesting in Alaska - Yukon outside of these strata.

Actual red-throated loons observed are expanded for area only.

Table 6. Alaska-Yukon. Ten year trend in Pacific loon breeding population observations, 1996 - 2005 (estimates in thousands).

Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	1995 - 2004	% Change from 2004	% Change from Avg.
											Average		
1. Kenai-Susitna	0.3	0.3	0.3	0.4	0.4	0.6	0.4	0.3	0.3	0.6	0.4	+100	+50
2. Nelchina	0.1	0.4	0.1	0.1	0.4	0.1	0.7	0.1	0.1	0.0	0.3	-100	-100
3. Tanana-Kusko.	1.8	0.7	1.1	0.7	0.7	1.0	0.6	1.1	0.7	0.6	0.9	-14	-33
4. Yukon Flats	3.0	3.1	0.9	2.8	3.8	2.7	3.5	4.9	4.2	4.0	3.3	-5	+21
5. Innoko	0.4	0.2	0.2	0.5	0.5	0.6	0.2	0.6	0.5	0.3	0.4	-40	-25
6. Koyukuk	0.3	0.3	0.4	0.3	0.3	1.0	1.0	0.8	0.9	0.3	0.6	-67	-50
7. Copper Delta	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Subtotal - Interior	5.9	5.1	3.1	4.8	6.1	6.0	6.4	7.8	6.7	5.8	5.9	-13	-2
8. Bristol Bay	1.4	1.4	5.4	4.1	2.2	1.4	4.2	1.1	2.9	0.3	2.6	-90	-88
9. Yukon Delta	26.9	22.1	38.1	24.8	41.1	33.9	45.1	40.2	39.1	29.7	35.6	-24	-17
10. Seward Pen.	2.8	1.8	3.2	2.5	6.3	2.5	5.2	1.4	2.6	4.3	3.1	+65	+39
11. Kotzebue So.	2.6	2.6	1.9	0.8	4.7	2.2	2.9	3.0	2.0	3.1	2.5	+55	+24
Subtotal - Tundra	33.7	27.9	48.6	32.2	54.3	40.0	57.4	45.7	46.6	37.4	43.8	-20	-15
TOTAL - ALASKA	39.6	33.0	51.7	37.0	60.4	46.0	63.8	53.5	53.3	43.2	49.8	-19	-13
12. Old Crow Flats Yukon	2.0	1.6	1.3	2.6	1.7	3.3	3.9	3.0	3.4	3.6	2.7	+6	+33

Note: There are additional Pacific loons nesting in Alaska - Yukon outside of these strata.

Actual Pacific loons observed are expanded for area only.

Table 7. Alaska-Yukon. Ten year trend in common loon breeding population observations, 1996 - 2005 (estimates in thousands).

Stratum	1996	1997	1998	1999	2000	Y E A R 2001	2002	2003	2004	2005	1995 - 2004	% Change from 2004	% Change from Avg.
											Average		
1. Kenai-Susitna	1.4	1.8	1.6	1.6	2.0	2.6	1.9	1.7	1.6	2.0	1.7	+25	+18
2. Nelchina	0.1	0.4	0.1	0.4	0.1	0.5	0.1	0.3	0.5	0.0	0.3	-100	-100
3. Tanana-Kusko.	1.9	0.8	1.1	2.1	2.5	0.4	2.0	2.4	1.3	1.2	1.6	-8	-25
4. Yukon Flats	0.1	0.7	0.5	1.4	0.9	0.3	1.8	3.1	1.9	1.1	1.1	-42	+0
5. Innoko	0.3	0.0	0.2	0.4	0.2	0.2	0.2	0.5	0.0	0.5	0.2	-	+150
6. Koyukuk	0.5	0.7	0.4	0.6	0.5	1.2	0.8	0.8	1.3	0.6	0.7	-54	-14
7. Copper Delta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Subtotal - Interior	4.3	4.4	3.9	6.5	6.2	5.2	6.8	8.8	6.6	5.4	5.7	-18	-5
8. Bristol Bay	1.7	0.0	0.9	0.8	0.8	0.1	1.2	1.4	1.5	1.1	0.9	-27	+22
9. Yukon Delta	2.4	2.1	3.2	2.1	2.4	1.6	2.6	2.3	2.9	3.3	2.4	+14	+37
10. Seward Pen.	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	+0	-
11. Kotzebue So.	0.4	0.0	0.3	0.4	0.3	0.1	0.1	0.2	0.2	0.6	0.2	+200	+200
Subtotal - Tundra	4.5	2.1	4.4	3.4	3.5	1.8	3.9	3.9	4.7	5.1	3.6	+9	+42
TOTAL - ALASKA	8.8	6.5	8.3	9.9	9.7	7.0	10.7	12.7	11.3	10.5	9.4	-7	+12
12. Old Crow Flats Yukon	0.3	0.3	0.3	0.0	0.1	0.3	0.2	0.5	0.1	0.2	0.3	+100	-33

Note: There are additional common loons nesting in Alaska - Yukon outside of these strata.

Actual common loons observed are expanded for area only.

Table 8. Alaska-Yukon. Stratum data sheet, 2005, strata 1 through 12.

Survey Design	Stratum												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
Square miles in stratum	2200	3900	9300	10800	3400	4100	400	9900	26600	3850	5350	1970	81,770
Square miles in sample	40	52	132	80	44	80	20	92	260	28	48	36	912
Linear miles in sample	160	208	528	320	176	320	80	368	1040	112	192	144	3,648
No. of transects in sample	6	10	18	12	7	10	7	11	8	4	7	3	103
No. of segments in sample	10	13	33	20	11	20	10	23	65	7	12	8	232
Expansion factor	55.000	75.000	70.455	135.000	77.273	51.250	20.000	107.609	102.308	137.500	111.458	54.722	-

Current Year Design	Stratum												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
Square miles in sample	28	52	132	80	44	80	0	92	260	28	48	36	880
Linear miles in sample	112	208	528	320	176	320	0	368	1040	112	192	144	3,520
No. of transects in sample	6	10	18	12	7	10	0	11	8	4	7	3	96
No. of segments in sample	7	13	33	20	11	20	0	23	65	7	12	8	219
Expansion factor	78.571	75.000	70.455	135.000	77.273	51.250	0.000	107.609	102.308	137.500	111.458	54.722	-

Note: Stratum 7 has 8 mile segments; stratum 12 has 18 mile segments.

Table 9. Relationship of total ducks to square miles of habitat and number of ponds in 2005 .

	Sq. Miles of Habitat	Number of Ponds (thousands)	Total Ducks (thousands)	Ponds per Sq. Mi.	Ducks per Sq. Mi.	Ducks per Pond
1. Kenai-Susitna	2200	17.5	59.8	8.0	27.2	3.4
2. Nelchina	3900	52.5	123.7	13.5	31.7	2.4
3. Tanana-Kusko.	9300	113.4	561.0	12.2	60.3	4.9
4. Yukon Flats	10800	109.8	1257.5	10.2	116.4	11.5
5. Innoko	3400	57.3	210.4	16.9	61.9	3.7
6. Koyukuk	4100	68.1	182.2	16.6	44.4	2.7
7. Copper Delta	400	19.0	25.1	47.5	62.8	1.3
Subtotal - Interior	34100	437.6	2419.7	12.8	71.0	5.5
8. Bristol Bay	9900	209.3	499.3	21.1	50.4	2.4
9. Yukon Delta	26600	960.1	1678.4	36.1	63.1	1.7
10. Seward Pen.	3850	94.1	291.2	24.4	75.6	3.1
11. Kotzebue So.	5350	87.8	403.3	16.4	75.4	4.6
Subtotal - Tundra	45700	1351.3	2872.2	29.6	62.8	2.1
TOTAL - ALASKA	79800	1788.9	5291.9	22.4	66.3	3.0
12. Old Crow Flats Yukon	1970	27.1	283.0	13.8	143.7	10.4

Note: Number of ponds is averaged from 1982-1984 transect counts
 Totals are for surveyed areas only.

DATES: 5 / 15 / 2005 THRU 5 / 15 / 2005

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED		VISIBILITY RATIO (V)	POPULATION INDEX	
				BIRDS (T)	TOTAL BIRDS		(P)	
MALLARD	29	7		72	3.57	20196	20.2	
BLACK DUCK					2.76			
GADWALL					3.04			
AMERICAN WIGEON	4	4		16	3.65	4589	4.6	
GREEN-WINGED TEAL	2	2	5	13	8.88	9070	9.1	
BLUE-WINGED TEAL					10.31			
SHOVELER	1	3		8	3.35	2106	2.1	
PINTAIL	3	2		10	2.51	1972	2.0	
REDHEAD a					3.11			
CANVASBACK					2.43			
SCAUP a	16	6	5	33	1.82	4719	4.7	
RING-NECKED DUCK a	2	3		8	4.02	2527	2.5	
GOLDENEYE	5	1		12	3.61	3404	3.4	
BUFFLEHEAD	2	1		6	1.86	877	0.9	
LONG-TAILED DUCK					1.99			
EIDER					3.58			
SCOTER	4	8		24	1.08	2037	2.0	
RUDDY DUCK					5.94			
MERGANSER	1	3	75	83	1.27	8282	8.3	
SUB - TOTAL	69	40	85	285		59778	59.8	
CANADA GOOSE	2			4	1.00	314	0.3	
SWAN		3	4	10	1.00	786	0.8	
CRANE	3			3	1.00	236	0.2	

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	2200
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	28
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	7
V = VISIBILITY RATIO	EXPANSION FACTOR	78.571
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

DATES: 6 / 7 / 2005 THRU 6 / 7 / 2005

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED		POPULATION INDEX
				BIRDS (T)	VISIBILITY RATIO (V)	
MALLARD	30	8	76	3.57	20349	20.3
BLACK DUCK				2.76		
GADWALL				3.04		
AMERICAN WIGEON	25	10	70	3.65	19163	19.2
GREEN-WINGED TEAL	5	4	18	8.88	11988	12.0
BLUE-WINGED TEAL				10.31		
SHOVELER	6	2	16	3.35	4020	4.0
PINTAIL	5		10	2.51	1883	1.9
REDHEAD a				3.11		
CANVASBACK				2.43		
SCAUP a	65	97	25	1.82	38766	38.8
RING-NECKED DUCK a	10	11	32	4.02	9648	9.6
GOLDENEYE	3	3	12	3.61	3249	3.2
BUFFLEHEAD	18	7	50	1.86	6975	7.0
LONG-TAILED DUCK				1.99		
EIDER				3.58		
SCOTER	13	17	30	1.08	7290	7.3
RUDDY DUCK				5.94		
MERGANSER		2	4	1.27	381	0.4
SUB - TOTAL	180	161	55	662	123711	123.7
CANADA GOOSE				1.00		
SWAN	13	15	3	1.00	3450	3.5
CRANE				1.00		

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	3900
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	52
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	13
V = VISIBILITY RATIO	EXPANSION FACTOR	75.000
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

DATES: 5 / 18 / 2005 THRU 5 / 27 / 2005

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED		VISIBILITY (V)	POPULATION INDEX (P)
				BIRDS (T)	TOTAL BIRDS (V)		
MALLARD	110	46	30	342	3.57	86021	86.0
BLACK DUCK					2.76		
GADWALL					3.04		
AMERICAN WIGEON	88	75	17	343	3.65	88206	88.2
GREEN-WINGED TEAL	49	34		166	8.88	103856	103.9
BLUE-WINGED TEAL					10.31		
SHOVELER	73	60	45	311	3.35	73403	73.4
PINTAIL	55	12	5	139	2.51	24581	24.6
REDHEAD a					3.11		
CANVASBACK	9	8	60	94	2.43	16093	16.1
SCAUP a	74	133	277	617	1.82	79116	79.1
RING-NECKED DUCK a	19	28		75	4.02	21242	21.2
GOLDENEYE	27	19		92	3.61	23399	23.4
BUFFLEHEAD	38	43	18	180	1.86	23588	23.6
LONG-TAILED DUCK	4	1		10	1.99	1402	1.4
EIDER					3.58		
SCOTER	25	62	83	257	1.08	19555	19.6
RUDDY DUCK					5.94		
MERGANSER	3			6	1.27	537	0.5
SUB - TOTAL	574	521	535	2632		560999	561.0
CANADA GOOSE	2			4	1.00	282	0.3
SWAN	15	23	12	73	1.00	5143	5.1
CRANE	2	1	4	8	1.00	564	0.6

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	9300
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	132
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	33
V = VISIBILITY RATIO	EXPANSION FACTOR	70.455
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

DATES: 5 / 20 / 2005 THRU 5 / 20 / 2005

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED			POPULATION INDEX
				TOTAL BIRDS	(T)	VISIBILITY RATIO (V)	
MALLARD	73	54	29	283	3.57	136.4	136392
BLACK DUCK					2.76		
GADWALL					3.04		
AMERICAN WIGEON	80	179	26	544	3.65	268.1	268056
GREEN-WINGED TEAL	29	42	5	147	8.88	176.2	176224
BLUE-WINGED TEAL	1			2	10.31	2.8	2784
SHOVELER	87	119	57	469	3.35	212.1	212105
PINTAIL	72	73	62	352	2.51	119.3	119275
REDHEAD a					3.11		
CANVASBACK	19	36	20	130	2.43	42.6	42647
SCAUP a	115	307	154	883	1.82	217.0	216953
RING-NECKED DUCK a	13	18	11	60	4.02	32.6	32562
GOLDENEYE	10	8		36	3.61	17.5	17545
BUFFLEHEAD	21	10		62	1.86	15.6	15568
LONG-TAILED DUCK					1.99		
EIDER					3.58		
SCOTER	12	18	49	109	1.08	15.9	15892
RUDDY DUCK					5.94		
MERGANSER	3	1		8	1.27	1.4	1372
SUB - TOTAL	535	865	413	3085			1257374
CANADA GOOSE	5	7	3	27	1.00	3.6	3645
SWAN	1	1		3	1.00	0.4	405
CRANE	4	2		8	1.00	1.1	1080

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	10800
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	80
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	20
V = VISIBILITY RATIO	EXPANSION FACTOR	135.000
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

DATES: 5 / 27 / 2005 THRU 5 / 27 / 2005

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED		POPULATION INDEX
				BIRDS (T)	VISIBILITY RATIO (V)	
MALLARD	38	8		92	3.57	25379 25.4
BLACK DUCK					2.76	
GADWALL					3.04	
AMERICAN WIGEON	58	26	12	180	3.65	50768 50.8
GREEN-WINGED TEAL	8	12		40	8.88	27447 27.4
BLUE-WINGED TEAL					10.31	
SHOVELER	40	14		108	3.35	27957 28.0
PINTAIL	111	8		238	2.51	46161 46.2
REDHEAD a					3.11	
CANVASBACK			11	11	2.43	2066 2.1
SCAUP a	25	21	17	84	1.82	11813 11.8
RING-NECKED DUCK a	3	1		5	4.02	1553 1.6
GOLDENEYE	1	4		10	3.61	2790 2.8
BUFFLEHEAD		5		10	1.86	1437 1.4
LONG-TAILED DUCK	2			4	1.99	615 0.6
EIDER					3.58	
SCOTER	1	17	102	138	1.08	11517 11.5
RUDDY DUCK					5.94	
MERGANSER	2	2		8	1.27	785 0.8
SUB - TOTAL	289	118	142	928		210289 210.4
CANADA GOOSE	4	9		26	1.00	2009 2.0
SWAN	6	3	4	16	1.00	1236 1.2
CRANE	3	2		7	1.00	541 0.5

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	3400
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	44
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	11
V = VISIBILITY RATIO	EXPANSION FACTOR	77.273
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

DATES: 5 / 21 / 2005 THRU 5 / 21 / 2005

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED		VISIBILITY RATIO (V)	POPULATION INDEX	
				BIRDS (T)	TOTAL BIRDS		(P)	
MALLARD	55	27			164	3.57	30006	30.0
BLACK DUCK						2.76		
GADWALL						3.04		
AMERICAN WIGEON	50	42	5		189	3.65	35355	35.4
GREEN-WINGED TEAL	17	8			50	8.88	22755	22.8
BLUE-WINGED TEAL						10.31		
SHOVELER	24	25			98	3.35	16825	16.8
PINTAIL	90	29			238	2.51	30616	30.6
REDHEAD a						3.11		
CANVASBACK	2		32		36	2.43	4483	4.5
SCAUP a	44	86	112		328	1.82	30594	30.6
RING-NECKED DUCK a	5	9			23	4.02	4739	4.7
GOLDENEYE	2	2			8	3.61	1480	1.5
BUFFLEHEAD	6	3			18	1.86	1716	1.7
LONG-TAILED DUCK						1.99		
EIDER						3.58		
SCOTER	7	19			52	1.08	2878	2.9
RUDDY DUCK						5.94		
MERGANSER	3	2			10	1.27	651	0.7
SUB - TOTAL	305	252	149		1214		182098	182.2
CANADA GOOSE	3	1			8	1.00	410	0.4
SWAN	6	5			16	1.00	820	0.8
CRANE	5	3			11	1.00	564	0.6

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	4100
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	80
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	20
V = VISIBILITY RATIO	EXPANSION FACTOR	51.250
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

DATES: 5 / 27 / 2005 THRU 5 / 29 / 2005

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED		VISIBILITY RATIO (V)	POPULATION INDEX	
				BIRDS (T)	TOTAL BIRDS (V)		(P)	
MALLARD	73	24	15	209	4.01	90186	90.2	
BLACK DUCK					1.56			
GADWALL		3		6	3.04	1963	2.0	
AMERICAN WIGEON	36	24		120	3.84	49586	49.6	
GREEN-WINGED TEAL	21	20		82	8.36	73768	73.8	
BLUE-WINGED TEAL					10.31			
SHOVELER	35	14	10	108	3.79	44046	44.0	
PINTAIL	55	16	24	166	3.05	54482	54.5	
REDHEAD a					3.11			
CANVASBACK					2.43			
SCAUP a	51	117	120	405	1.93	84112	84.1	
RING-NECKED DUCK a					4.02			
GOLDENEYE					3.61			
BUFFLEHEAD					1.86			
LONG-TAILED DUCK	4	12		32	1.87	6439	6.4	
EIDER					3.58			
SCOTER	38	236	159	707	1.17	89013	89.0	
RUDDY DUCK					5.94			
MERGANSER	9	8	8	42	1.27	5740	5.7	
SUB - TOTAL	322	474	336	1877		499336	499.3	
CANADA GOOSE	1			2	1.00	215	0.2	
SWAN	37	21	145	224	1.00	24104	24.1	
CRANE	7	8		23	1.00	2475	2.5	

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	9900
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	92
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	23
V = VISIBILITY RATIO	EXPANSION FACTOR	107.609
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

DATES: 5 / 30 / 2005 THRU 6 / 3 / 2005

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	TOTAL BIRDS	VISIBILITY RATIO (V)	POPULATION INDEX	
						(T)	(P)
MALLARD	170	68	8	484	4.01	198563	198.6
BLACK DUCK					1.56		
GADWALL					3.04		
AMERICAN WIGEON	145	79	23	471	3.84	185038	185.0
GREEN-WINGED TEAL	89	40		258	8.36	220665	220.7
BLUE-WINGED TEAL					10.31		
SHOVELER	169	76	16	506	3.79	196200	196.2
PINTAIL	458	119	51	1205	3.05	376006	376.0
REDHEAD a					3.11		
CANVASBACK	4	1	55	65	2.43	16160	16.2
SCAUP a	199	602	246	1649	1.93	325601	325.6
RING-NECKED DUCK a	2	1		4	4.02	1645	1.6
GOLDENEYE	5			10	3.61	3693	3.7
BUFFLEHEAD					1.86		
LONG-TAILED DUCK	42	49	5	187	1.87	35776	35.8
EIDER	6	2		16	3.58	5860	5.9
SCOTER	78	315	102	888	1.17	106294	106.3
RUDDY DUCK					5.94		
MERGANSER	7	9	20	52	1.27	6756	6.8
SUB - TOTAL	1374	1361	526	5795		1678257	1678.4
CANADA GOOSE	74	101	164	514	1.00	52586	52.6
SWAN	274	123	510	1030	1.00	105377	105.4
CRANE	98	50	20	218	1.00	22303	22.3

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	26600
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	260
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	65
V = VISIBILITY RATIO	EXPANSION FACTOR	102.308
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

DATES: 6 / 3 / 2005 THRU 6 / 3 / 2005

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED		POPULATION INDEX
				TOTAL BIRDS (T)	VISIBILITY RATIO (V)	
MALLARD	13	7		40	4.01	22055 22.1
BLACK DUCK					1.56	
GADWALL					3.04	
AMERICAN WIGEON	13	12	8	58	3.84	30624 30.6
GREEN-WINGED TEAL	3	7		20	8.36	22990 23.0
BLUE-WINGED TEAL					10.31	
SHOVELER	9	5		28	3.79	14592 14.6
PINTAIL	106	15	77	319	3.05	133781 133.8
REDHEAD a					3.11	
CANVASBACK					2.43	
SCAUP a	24	33	10	100	1.93	26538 26.5
RING-NECKED DUCK a					4.02	
GOLDENEYE					3.61	
BUFFLEHEAD					1.86	
LONG-TAILED DUCK	9	8	8	42	1.87	10799 10.8
EIDER		2		4	3.58	1969 2.0
SCOTER	9	54	36	162	1.17	26062 26.1
RUDDY DUCK					5.94	
MERGANSER	2	3		10	1.27	1746 1.7
SUB - TOTAL	188	146	139	783		291155 291.2
CANADA GOOSE	4	6	3	23	1.00	3163 3.2
SWAN	26	7		40	1.00	5500 5.5
CRANE	8	4		16	1.00	2200 2.2

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	3850
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	28
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	7
V = VISIBILITY RATIO	EXPANSION FACTOR	137.500
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

DATES: 6 / 4 / 2005 THRU 6 / 4 / 2005

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED		POPULATION INDEX
				TOTAL BIRDS (T)	VISIBILITY RATIO (V)	
MALLARD	39	17	112	4.01	50058	50.1
BLACK DUCK				1.56		
GADWALL	1		2	3.04	678	0.7
AMERICAN WIGEON	68	14	164	3.84	70192	70.2
GREEN-WINGED TEAL	9	7	32	8.36	29817	29.8
BLUE-WINGED TEAL				10.31		
SHOVELER	49	14	126	3.79	53226	53.2
PINTAIL	89	28	30	3.05	89746	89.7
REDHEAD a				3.11		
CANVASBACK	12		24	2.43	6500	6.5
SCAUP a	78	135	6	1.93	76151	76.2
RING-NECKED DUCK a	2	1	4	4.02	1792	1.8
GOLDENEYE				3.61		
BUFFLEHEAD	3		6	1.86	1244	1.2
LONG-TAILED DUCK	11	5	32	1.87	6670	6.7
EIDER				3.58		
SCOTER	11	49	120	1.17	15649	15.6
RUDDY DUCK				5.94		
MERGANSER	1	1	7	1.27	1557	1.6
SUB - TOTAL	373	271	43	1251	403280	403.3
CANADA GOOSE	16	14	34	1.00	10477	10.5
SWAN	36	12	60	1.00	6688	6.7
CRANE	11	3	11	1.00	3121	3.1

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	5350
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	48
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	12
V = VISIBILITY RATIO	EXPANSION FACTOR	111.458
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

DATES: 6 / 5 / 2005 THRU 6 / 5 / 2005

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED		POPULATION INDEX
				TOTAL BIRDS (T)	VISIBILITY RATIO (V)	
MALLARD	23	24		94	2.74	14094 14.1
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	68	33		202	6.21	68645 68.6
GREEN-WINGED TEAL	10	3		26	7.84	11155 11.2
BLUE-WINGED TEAL					10.31	
SHOVELER	20	24	16	104	3.49	19862 19.9
PINTAIL	43	21	46	174	2.66	25328 25.3
REDHEAD a	1			1	3.11	170 0.2
CANVASBACK	14	10		48	2.59	6803 6.8
SCAUP a	97	184	35	500	2.29	62657 62.7
RING-NECKED DUCK a	1	4		9	4.02	1980 2.0
GOLDENEYE	3	3	15	27	3.61	5334 5.3
BUFFLEHEAD		1		2	2.21	242 0.2
LONG-TAILED DUCK	10	11		42	1.99	4574 4.6
EIDER					3.58	
SCOTER	102	222	41	689	1.43	53916 53.9
RUDDY DUCK					5.94	
MERGANSER	3	2	108	118	1.27	8201 8.2
SUB - TOTAL	395	542	261	2036		282959 283.0
CANADA GOOSE	3		5	11	1.00	602 0.6
SWAN	3	3		9	1.00	493 0.5
CRANE	1		4	5	1.00	274 0.3

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	1970
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	36
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	8
V = VISIBILITY RATIO	EXPANSION FACTOR	54.722
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).